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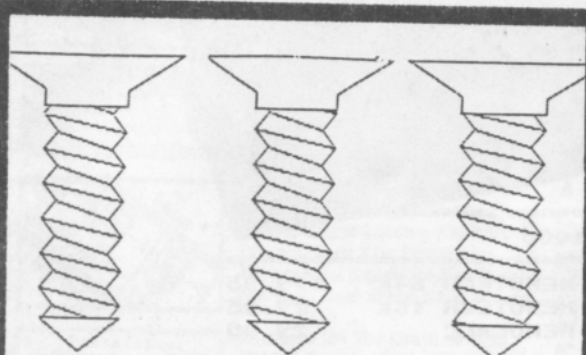
JULY AUGUST

No. 15

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**Byte Mapped Scroll
on the TS 2068**

**80-column Printer Use
with ZX81 Vucalc**



NOTES ON VU-CALC AND THE 80-COL. PRINTER
BOXES CONTAIN NUMERIC REPRESENTATION OF THEIR LOCATIONS

1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09
2.01	2.02	2.03	2.04	2.05	2.06	2.07	2.08	2.09
3.01	3.02	3.03	3.04	3.05	3.06	3.07	3.08	3.09
4.01	4.02	4.03	4.04	4.05	4.06	4.07	4.08	4.09
5.01	5.02	5.03	5.04	5.05	5.06	5.07	5.08	5.09
6.01	6.02	6.03	6.04	6.05	6.06	6.07	6.08	6.09
7.01	7.02	7.03	7.04	7.05	7.06	7.07	7.08	7.09
8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.09
9.01	9.02	9.03	9.04	9.05	9.06	9.07	9.08	9.09
10.01	10.02	10.03	10.04	10.05	10.06	10.07	10.08	10.09
11.01	11.02	11.03	11.04	11.05	11.06	11.07	11.08	11.09
12.01	12.02	12.03	12.04	12.05	12.06	12.07	12.08	12.09
13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08	13.09
14.01	14.02	14.03	14.04	14.05	14.06	14.07	14.08	14.09
15.01	15.02	15.03	15.04	15.05	15.06	15.07	15.08	15.09
16.01	16.02	16.03	16.04	16.05	16.06	16.07	16.08	16.09
17.01	17.02	17.03	17.04	17.05	17.06	17.07	17.08	17.09
18.01	18.02	18.03	18.04	18.05	18.06	18.07	18.08	18.09
19.01	19.02	19.03	19.04	19.05	19.06	19.07	19.08	19.09
20.01	20.02	20.03	20.04	20.05	20.06	20.07	20.08	20.09
21.01	21.02	21.03	21.04	21.05	21.06	21.07	21.08	21.09
22.01	22.02	22.03	22.04	22.05	22.06	22.07	22.08	22.09
23.01	23.02	23.03	23.04	23.05	23.06	23.07	23.08	23.09
24.01	24.02	24.03	24.04	24.05	24.06	24.07	24.08	24.09
25.01	25.02	25.03	25.04	25.05	25.06	25.07	25.08	25.09

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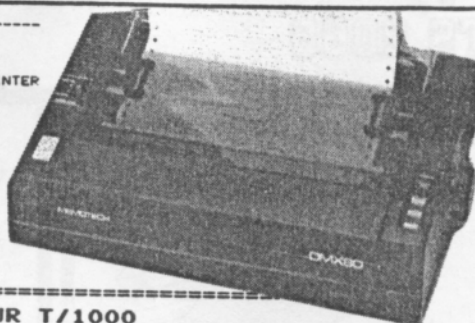
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#2 Dec'83 Matrix/Cursor Input (Johnson), User-Friendliness, Reset Switch Project, Memory Reduction, Rule of 78, ZX Cash Register, Graphics Tutorial, etc!



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#13 April 84 - Complete 2068 W.P. Listing, TS1000 Simulated READ-DATA Worm Enhancements, User Defined Graphics for 2068, "Try These", Changing "Fonts"-2068, Reviews.

#14 May/June '85 Special HARDWARE Issue, TS1000 Keyboard Add-on, ZX81 Rampacks on the 2068, Surge Suppressor Project, User Group Report, W.P. Eval. Concluded, QL Report, Cassette Tips.

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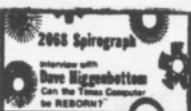
#6 June'84 Ts1000 As Church Aid, Interfacing Books, Num. Analysis, Hardware Tips, "WORM"-2, Switching-3, Good News from EA Brown, Six Reviews, and more!



#7 July/Aug'84, Telecommunications Issue, 2068 Program Tips, How A Compiler Works, Rotating Globe, Byte-Back Modem, TC for Beginner, Switching-4, WORM-3, S.I.N., etc.



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Dear Reader

Welcome to TS Horizons no. 15. We sincerely apologize for being so late with this issue. Now that summer is over and the Duncan household is getting back to normal we hope to be much more dependable and consistent in the future.

WE have been pleased and amazed at the patience that many of our subscribers, advertisers, and writers have shown over past weeks. Among other difficulties that have occurred recently, my wife had to have surgery for carpal tunnel syndrome - nothing life threatening but she was unable to use her hands for about a month. With a new baby and a 3-year-old this took a lot of time away from TS Horizons. However we plan to make that up to you in the coming months.

More TS1000 Articles

This issue contains the first of a series of machine code articles for the TS1000. This series, as the name "MC

for the Masses" implies, is written at a basic level so even novices like myself can get a lot out of it. As far as I can recall nothing of this genre has been published since the days of SYNC. We welcome the author, Kevin Bulgrien, and I personally appreciate his patience in dealing with TS Horizons. With the other TS1000 articles by John Marion, Peter McMullin, and James Holder, as well as the material for the TS 2068 we hope we have satisfied all of our readers this time.

On a somewhat related subject we have received several letters concerning the inclusion of "QL Report" in TS Horizons. Some readers are glad to see it, while others feel that that feature is taking up room that could better be used to cover other subjects especially the TS1000. Our feeling is that coverage of the QL in TS Horizons is very appropriate. However we don't anticipate that we will devote much more than a page or so per issue simply because at this point we cannot do justice to it.

By the way the QL Report as it appears here is a short version of the Curry Computer's authentic report. If you have a real interest in the machine you should write or call Curry to be put on their mailing list. The original report is four pages (expect it to expand soon), and mailed on schedule the first of every month, and it contains a lot of material we don't have room for.

Well I hope you enjoy this issue and that it was worth the wait.

Sincerely, Rick Duncan

try these

The following program was submitted by Bernard Bush of Mansfield MO.

```
5 REM MOSAIC
6 REM B BUSH DEC 82
10 LET T=0
20 LET A=.5
30 LET B=96.5
40 LET C=.005
50 LET D=8
60 FAST
70 PRINT A,,B,,C,,D
80 LET T=T+C
85 IF T>4.2 THEN GOTO 200
90 LET X=20+D*COS (A*T*PI)
100 LET Y=20-20*SIN (B*T*PI)
110 PLOT X+14,Y
120 PLOT Y+14,X
130 IF INKEY$="F" THEN FAST
140 IF INKEY$="S" THEN SLOW
150 GOTO 80
200 SLOW
210 FOR L=1 TO 600
220 NEXT L
230 LET T=0
240 LET A=A+1
250 CLS
260 GOTO 60
```

```
10 SLOW
20 FAST
30 GOTO 10
```

This 3-line program appeared in the October '83 issue of Syntax and was submitted by Billy Casebeer.

TSH regular John Bell submitted the following.

```
10 LET S1=0
20 LET S2=100
30 SOUND 0,S1;1,0;2,S2;3,S1;7,
60;8,10;9,10
40 LET S1=S1+2*INT S2/100
50 LET S2=S2+INT S2/50
60 PAUSE 10
70 GO TO 30
```

This program was submitted by Kevin Steltman, age 11, of Vista, CA. (Note: In lines 30 and 40 all letters in quotes should be typed in the graphics mode.)

```
10 FOR r=0 TO 47: READ a: POKE
65368+r,a: NEXT r
15 DATA 56,62,56,40,36,68,132,
67
20 DATA 0,0,56,48,56,56,16,56
25 DATA 56,62,56,56,32,32,32,4
8
27 DATA 0,0,28,12,28,28,8,28
28 DATA 28,124,28,28,4,4,12
29 DATA 28,124,28,20,36,34,33,
194
30 FOR r=0 TO 31: PRINT AT 20,
r;"B";AT 21,r;"C": PAUSE 4: PRIN
T AT 20,r;"B";AT 21,r;"A": PAUSE
7: PRINT AT 20,r;" ";AT 21,r;" "
": NEXT r
40 FOR r=31 TO 0 STEP -1: PRIN
T AT 20,r;"D";AT 21,r;"E": PAUSE
4: PRINT AT 20,r;"D";AT 21,r;"F
": PAUSE 7: PRINT AT 20,r;" ";AT
21,r;" ": NEXT r
50 GO TO 20
```

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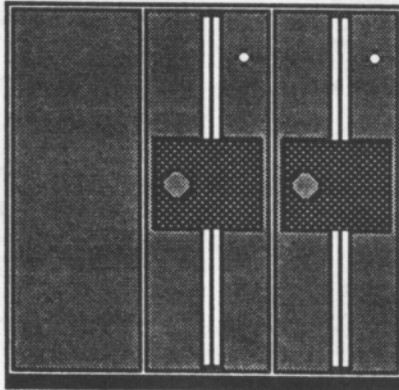
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TS Help & Information

TS HELP AND INFORMATION by John Marion

Modifications to Add-on Keyboard

NOTE: T-S HORIZONS and the author assume no responsibility for any damages arising from the use or misuse of this article. The reader must understand that any modification suggested here is to be taken at the reader's own risk.

Last month I told how to convert a TI keyboard to work on your TS 1000. If you were successful in getting it to work, you should now have a nice new addition to your computer. As promised last month I will now describe some uses for those extra keys on the converted keyboard.

The first addition we will look at is a shift lock key, which makes editing a one finger job. The ALPHA LOCK key is the one we will use. To convert this key, all you need to do is connect both terminals from the ALPHA LOCK key to both terminals of the SHIFT key just above it. See figure 1. Once this is done you are now ready to test this new key. Turn on the computer as normal, when the K appears, enter a short line of BASIC. If the keyboard won't accept it, make sure the ALPHA LOCK is in the upper position. Now that the one line has been entered, do a shift I to place the computer in the edit mode. Now press the ALPHA LOCK, placing it in the lower position. The cursor can now be moved around, with a simple one finger action. Before re-entering the line of BASIC make sure to place the ALPHA LOCK back in the upper position. The following keys are also one finger action, with the ALPHA LOCK down: Function, Delete and Edit.

The next key we will add is a one key delete. Any remaining key can be used for this operation—I chose the key to the right of the P. For this new addition, you will need two diodes, of the 1N914/1N4148 type. These can be found at Radio Shack for under a dollar. Follow the wiring diagram in Figure 2, to wire up this next addition. This new key can be very handy when entering a program, for you don't need to use the shift.

The last addition I will describe is a single key Function key. As you may have guessed I chose to use the key marked FCTN, just below the right shift key. Again you will need two more diodes, of the 1N914/1N4148 type. Follow the wiring diagram in Figure 3, for the auto Function key.

If the new Function key is working properly, when you press it, an F should appear at the left bottom corner of the screen. If you press it again, the K should return, indicating that you are in the Keywork mode again.

If you were unable to get some or all of these new keys to work, recheck your wiring, and if you still have trouble, try different diodes, in the function and delete sections.

If you have any questions or suggestions, you can write me at the address given below.

John Marion
HC 63, Box 650
Greenup, KY 41144

TSH

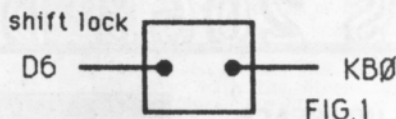


FIG. 1

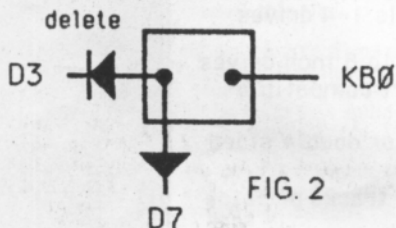


FIG. 2

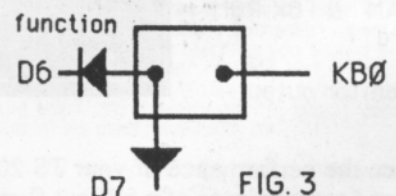


FIG. 3

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When you try out a new program, the first impression you get is from the graphics. In fact, clever graphics (or lack of) can make or break a well written but otherwise lackluster program. The following annotated routines show how simple but effective graphics displays are created. The program scrolls a 60 character message through a 16 character window, changes the message and then clears the screen. Type in the following program and run it. It's surprising what a few lines of BASIC will do.

Set a\$ to contain a 60 character message to be scrolled through the window. Repeat the first 16 characters of the message at the end.

```
10 LET a$="...T-S Horizons...Y
our TIMEX/SINCLAIR information s
ource.....T-S Horizons..."
```

Set the BORDER color, clear the screen and set the temporary PAPER color. Note that if you set the PAPER color before the CLS command the entire screen changes color.

```
20 BORDER 4: CLS: PAPER 3
```

DRAW a fram around the window. It takes a few tries to get the PLOT - DRAW coordinates right if you move the window

```
30 PLOT 54,97: DRAW 131,0
40 DRAW 0,-11: DRAW -131,0
50 DRAW 0,11: PLOT 51,99
60 DRAW 137,0: DRAW 0,-15
70 DRAW -137,0: DRAW 0,15
```

Scroll the message three times.

```
80 FOR a=1 TO 3
```

Loop through each character of the message.

```
90 FOR b=1 TO 60
```

Slow down the message scroll and BEEP to get the users attention.

```
100 PAUSE 10: BEEP .01,3
```

PRINT 16 character slices of the message in the window.

```
110 PRINT AT 10,7;a$(b TO b+15)
```

End the two FOR-NEXT loops.

```
120 NEXT b: NEXT a
```

Turn the OVER command on.

```
130 OVER 1
```

"Roll" the message six times.

```
140 FOR a=1 TO 6
```

DRAW over the message, top to bottom with 8 lines. The OVER command causes the message in the window to be inverted.

```
150 FOR b=95 TO 88 STEP -1
160 PLOT 56,b: DRAW 127,0
170 PAUSE 3: NEXT b
```

Add a slight PAUSE and close the FOR-NEXT loop.

```
180 PAUSE 5: NEXT a
```

Turn off the OVER command and BEEP to get the users attention.

```
190 OVER 0: BEEP .05,2
200 BEEP .05,9: BEEP .06,20
```

PRINT a message so the user is sure the program is through.

```
210 PRINT AT 10,7;"PROGRAM COMP
LETE"
```

Change the temporary PAPER color 4 times.

```
220 FOR b=3 TO 7
```

Set the PAPER to the value of the variable "b".

```
230 PAPER b
```

This unusual FOR-NEXT loop PRINTS over each character in the window with the same character but with a different PAPER color underneath.

```
240 FOR a=7 TO 22
250 PRINT AT 10,a;SCREEN$(10,a)
```

PAUSE and then close a FOR-NEXT loop.

```
260 PAUSE 5: NEXT a
```

BEEP and close a FOR-NEXT loop.

```
270 BEEP .05,b#8: NEXT b
```

This elaborate FOR-NEXT loop creates a very unusual display for clearing the screen. It draws a line over the message window with the OVER command off, then redraws over the same line with the OVER command on, effectively clearing that line from the screen. Since this is done from the top down and from the bottom up at the same time, it appears that the window slowly vanishes! It will take quite a bit of experimenting to get this routine to work with different windows, but the effect is worth the effort.

```
280 FOR a=84 TO 91
```

```
290 OVER 0
```

```
300 PLOT 51,a+1: DRAW 137,0
```

```
310 PLOT 51,182-a: DRAW 137,0
```

```
320 OVER 1
```

```
330 PLOT 51,a: DRAW 137,0
```

```
340 PLOT 51,183-a: DRAW 137,0
```

```
350 BEEP .2,(a-84)*7
```

```
360 NEXT a: OVER 0
```

Now that you have several graphic routines, I hope you experiment with them and try to adapt them for use in your own programs. Next month, I'll have a short renumbering routine for the 2068 and 1000. TSH

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Notes on Vucalc & the 80-Column Printer

By James Holder

This program is written for my equipment, using 16K RAM, Memotech Centronics Interface and Seikosha 250 Printer. It should work on any set-up accepting LPRINT. Hardware specific modifications may be required.

by James W. Holder

VU-CALC is an excellent spreadsheet program considering the RAM limitations of the 16K machines. Its big problem is that the results are not offered in a satisfactory form, in large displays not even a reasonably usable form on the screen or 2040 printer. This new approach offers an alternative hard copy display.

This procedure divides the array into four pages, each containing up to 26 rows in nine columns of eight characters separated by a vertical rule. This is the full capacity of VU-CALC.

VU-CALC as it is written fills almost every available byte of the 16K RAM. Thanks to the extremely wasteful basic routines this can be managed to a point. This program will step through the array, selecting what I wish to print. I can print any page of data in any sequence I wish or return to the main menu and access most options.

MODIFYING THE BASIC ROUTINE

A word of caution, we are working very near the 16K maximum so work on the cleared program only. LOAD VU-CALC from your original tape. When the menu comes up, break to the listing (EDIT, STOP, ENTER), LLIST the basic from line 110 and get the VARS reading (PRINT PEEK 16400+256*PEEK 16401). Write this down, exceeding it does not guarantee a crash but it is a good warning.

Begin modifying the program by editing out all line numbers from 130 to 330 inclusive. The same for lines 3005 to 4010. Then lines 9005 to the end EXCEPT lines 9015, 9020, 9070 and 9080. Add to line 9020 a comma and line 9040 following PRINT (see the new listing). Replace the lines you removed (130 to 330 and 3005 to 4010) with lines from the new listing and change line 5020. When you have checked your work with the new list, SAVE the cleared list by command from the keyboard (it saves much quicker this way).

Test by "GOTO 110" and option 1. You can now do anything with VU-CALC you did before the changes except save without data or COPY the screen. Set up a test program of your own. The page breakpoints are 9, 18, 27 and 36 columns, but your program is not limited to these. When ready to try your 80-col. printout quit to the main menu and select option "4". The program then stops and asks you to enter the page number you want printed. Printing starts immediately after this input which can be in any sequence. To preselect the number of rows to be printed to the page, set line 4040 to "1 TO XXX STEP 9" so that "XXX" equals the number of rows * 9. Leave it at 234 for a full page.

If any set-up of the printer needs to be done, or printing such as titles is needed, do it from the keyboard as commands (no line number). SAVE for rapid-load systems can replace the cassette SAVE routine at 3000, as long as your VARS reading is not too high, or STOP the

NOTES ON VU-CALC AND THE 80-COL. PRINTER
ROWS CONTAIN NUMERIC REPRESENTATION OF THEIR LOCATIONS

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2.01	2.02	2.03	2.04	2.05	2.06	2.07	2.08	2.09
3.01	3.02	3.03	3.04	3.05	3.06	3.07	3.08	3.09
4.01	4.02	4.03	4.04	4.05	4.06	4.07	4.08	4.09
5.01	5.02	5.03	5.04	5.05	5.06	5.07	5.08	5.09
6.01	6.02	6.03	6.04	6.05	6.06	6.07	6.08	6.09
7.01	7.02	7.03	7.04	7.05	7.06	7.07	7.08	7.09
8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.09
9.01	9.02	9.03	9.04	9.05	9.06	9.07	9.08	9.09
10.01	10.02	10.03	10.04	10.05	10.06	10.07	10.08	10.09
11.01	11.02	11.03	11.04	11.05	11.06	11.07	11.08	11.09
12.01	12.02	12.03	12.04	12.05	12.06	12.07	12.08	12.09
13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08	13.09
14.01	14.02	14.03	14.04	14.05	14.06	14.07	14.08	14.09
15.01	15.02	15.03	15.04	15.05	15.06	15.07	15.08	15.09
16.01	16.02	16.03	16.04	16.05	16.06	16.07	16.08	16.09
17.01	17.02	17.03	17.04	17.05	17.06	17.07	17.08	17.09
18.01	18.02	18.03	18.04	18.05	18.06	18.07	18.08	18.09
19.01	19.02	19.03	19.04	19.05	19.06	19.07	19.08	19.09
20.01	20.02	20.03	20.04	20.05	20.06	20.07	20.08	20.09
21.01	21.02	21.03	21.04	21.05	21.06	21.07	21.08	21.09
22.01	22.02	22.03	22.04	22.05	22.06	22.07	22.08	22.09
23.01	23.02	23.03	23.04	23.05	23.06	23.07	23.08	23.09
24.01	24.02	24.03	24.04	24.05	24.06	24.07	24.08	24.09
25.01	25.02	25.03	25.04	25.05	25.06	25.07	25.08	25.09
26.01	26.02	26.03	26.04	26.05	26.06	26.07	26.08	26.09

1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1
14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1
15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1
16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1
17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1
18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1
24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1
26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1

1.19	1.2	1.21	1.22	1.23	1.24	1.25	1.26	1.27
2.19	2.2	2.21	2.22	2.23	2.24	2.25	2.26	2.27
3.19	3.2	3.21	3.22	3.23	3.24	3.25	3.26	3.27
4.19	4.2	4.21	4.22	4.23	4.24	4.25	4.26	4.27
5.19	5.2	5.21	5.22	5.23	5.24	5.25	5.26	5.27
6.19	6.2	6.21	6.22	6.23	6.24	6.25	6.26	6.27
7.19	7.2	7.21	7.22	7.23	7.24	7.25	7.26	7.27
8.19	8.2	8.21	8.22	8.23	8.24	8.25	8.26	8.27
9.19	9.2	9.21	9.22	9.23	9.24	9.25	9.26	9.27
10.19	10.2	10.21	10.22	10.23	10.24	10.25	10.26	10.27
11.19	11.2	11.21	11.22	11.23	11.24	11.25	11.26	11.27
12.19	12.2	12.21	12.22	12.23	12.24	12.25	12.26	12.27
13.19	13.2	13.21	13.22	13.23	13.24	13.25	13.26	13.27
14.19	14.2	14.21	14.22	14.23	14.24	14.25	14.26	14.27
15.19	15.2	15.21	15.22	15.23	15.24	15.25	15.26	15.27
16.19	16.2	16.21	16.22	16.23	16.24	16.25	16.26	16.27
17.19	17.2	17.21	17.22	17.23	17.24	17.25	17.26	17.27
18.19	18.2	18.21	18.22	18.23	18.24	18.25	18.26	18.27
19.19	19.2	19.21	19.22	19.23	19.24	19.25	19.26	19.27
20.19	20.2	20.21	20.22	20.23	20.24	20.25	20.26	20.27
21.19	21.2	21.21	21.22	21.23	21.24	21.25	21.26	21.27
22.19	22.2	22.21	22.22	22.23	22.24	22.25	22.26	22.27
23.19	23.2	23.21	23.22	23.23	23.24	23.25	23.26	23.27
24.19	24.2	24.21	24.22	24.23	24.24	24.25	24.26	24.27
25.19	25.2	25.21	25.22	25.23	25.24	25.25	25.26	25.27
26.19	26.2	26.21	26.22	26.23	26.24	26.25	26.26	26.27

1.29	1.3	1.31	1.32	1.33	1.34	1.35	1.36	1.37
2.29	2.3	2.31	2.32	2.33	2.34	2.35	2.36	2.37
3.29	3.3	3.31	3.32	3.33	3.34	3.35	3.36	3.37
4.29	4.3	4.31	4.32	4.33	4.34	4.35	4.36	4.37
5.29	5.3	5.31	5.32	5.33	5.34	5.35	5.36	5.37
6.29	6.3	6.31	6.32	6.33	6.34	6.35	6.36	6.37
7.29	7.3	7.31	7.32	7.33	7.34	7.35	7.36	7.37
8.29	8.3	8.31	8.32	8.33	8.34	8.35	8.36	8.37
9.29	9.3	9.31	9.32	9.33	9.34	9.35	9.36	9.37
10.29	10.3	10.31	10.32	10.33	10.34	10.35	10.36	10.37
11.29	11.3	11.31	11.32	11.33	11.34	11.35	11.36	11.37
12.29	12.3	12.31	12.32	12.33	12.34	12.35	12.36	12.37
13.29	13.3	13.31	13.32	13.33	13.34	13.35	13.36	13.37
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18.29	18.3	18.31	18.32	18.33	18.34	18.35	18.36	18.37
19.29	19.3	19.31	19.32	19.33	19.34	19.35	19.36	19.37
20.29	20.3	20.31	20.32	20.33	20.34	20.35	20.36	20.37
21.29	21.3	21.31	21.32	21.33	21.34	21.35	21.36	21.37
22.29	22.3	22.31	22.32	22.33	22.34	22.35	22.36	22.37
23.29	23.3	23.31	23.32	23.33	23.34	23.35	23.36	23.37
24.29	24.3	24.31	24.32	24.33	24.34	24.35	24.36	24.37
25.29	25.3	25.31	25.32	25.33	25.34	25.35	25.36	25.37
26.29	26.3	26.31	26.32	26.33	26.34	26.35	26.36	26.37

program and use keyboard commands, or delete line 4100, giving you about 90 bytes if that is necessary. Keep VARS value below the original reading when changing the routine. Lines 4075 and 4100 use your vertical rule symbol. Line 4100 has eight spaces between rules and is to make the printout easier to read. When through printing enter a page number above 4 to return to the main menu. The program output is as shown in page 2 and up. Lines above that on page one were by LPRINT

```

110 SLOW
120 CLS
130 PRINT "1= ENTER",,,, "2= CON
T",,,, "3= SAVE",,,, "4= 80-COL.
PRINT "
240 INPUT O$
250 IF CODE O$>32 THEN GOTO 240
270 GOTO VAL O$*1000
1000 CLEAR
1010 DIM B$(9825)
1015 POKE 16606,0
1020 LET Z=16770
1030 GOTO 5000
2000 LET Z=16812
2010 GOTO 5000
3000 CLS
3005 PRINT "TAPES ON RECORD"
3010 PRINT
3020 PRINT "PRESS NEWLINE"
3030 INPUT O$
3040 "SAVE "VU-CALC"
3050 GOTO 110
4000 CLS
4005 FAST
4010 PRINT " INPUT PAGE NO."
4015 INPUT Y
4020 IF Y>4 THEN GOTO 110
4025 LET I=Y*2106
4030 LET Z=I-2106
4040 FOR L=1 TO 234 STEP 9
4050 LET M=1
4060 FOR K=Z+L TO I STEP 234
4070 LPRINT B$(K+1 TO K+8);
4075 IF M<9 THEN LPRINT " ";
4080 LET M=M+1
4090 NEXT K
4100 LPRINT "

```

```

4110 NEXT L
4115 LPRINT
4120 LPRINT "PAGE ";Y
4125 GOTO 4000
5000 LET B$(1 TO 1)=B$(1 TO 1)
5002 CLS
5005 LET I=USR Z
5010 IF I=63479 THEN GOTO 5100
5020 IF I=0 OR I=255 THEN GOTO 1
10
5040 LET Z=17334
5050 GOTO 5005
5100 FAST
5110 RAND USR 18929
5120 LET Z=17334
5130 SLOW
5140 GOTO 5005
9000 CLS
9002 SLOW
9015 LET A=PEEK (16601)+1
9020 PRINT " ";CHR$(INT (A/1
0)+28);CHR$(A-INT (A/10)+10+28)
";CHR$(PEEK 16523+38)
9070 INPUT O$
9080 GOTO 2000

```

9

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commands from the keyboard.

Do not change the program in any fashion with data in the array. A crash is inevitable if you try Option 2, Continue.

Good luck and write if I can help. (Please enclose SASE)

James Holder
508 Graycroft Road Huntsville, AL 35802

TSH

NOTES ON VU-CALC AND THE 80-COL. PRINTER
BOXES CONTAIN NUMERIC REPRESENTATION OF THEIR LOCATIONS

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4.01	4.02	4.03	4.04	4.05	4.06	4.07	4.08	4.09
5.01	5.02	5.03	5.04	5.05	5.06	5.07	5.08	5.09
6.01	6.02	6.03	6.04	6.05	6.06	6.07	6.08	6.09
7.01	7.02	7.03	7.04	7.05	7.06	7.07	7.08	7.09
8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.09
9.01	9.02	9.03	9.04	9.05	9.06	9.07	9.08	9.09
10.01	10.02	10.03	10.04	10.05	10.06	10.07	10.08	10.09
11.01	11.02	11.03	11.04	11.05	11.06	11.07	11.08	11.09
12.01	12.02	12.03	12.04	12.05	12.06	12.07	12.08	12.09
13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08	13.09
14.01	14.02	14.03	14.04	14.05	14.06	14.07	14.08	14.09
15.01	15.02	15.03	15.04	15.05	15.06	15.07	15.08	15.09
16.01	16.02	16.03	16.04	16.05	16.06	16.07	16.08	16.09
17.01	17.02	17.03	17.04	17.05	17.06	17.07	17.08	17.09
18.01	18.02	18.03	18.04	18.05	18.06	18.07	18.08	18.09
19.01	19.02	19.03	19.04	19.05	19.06	19.07	19.08	19.09
20.01	20.02	20.03	20.04	20.05	20.06	20.07	20.08	20.09
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24.01	24.02	24.03	24.04	24.05	24.06	24.07	24.08	24.09
25.01	25.02	25.03	25.04	25.05	25.06	25.07	25.08	25.09
26.01	26.02	26.03	26.04	26.05	26.06	26.07	26.08	26.09

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Machine Code for the Masses

By Kevin Bulgrien

Hi, my name is Kevin -- and I'm addicted to the T/S 1000. The only problem is that there aren't enough challenging articles on the TS to keep me high. That's why I offered to write up some articles for you and the great guys at TS Horizons. It will not only give me something worthwhile to do, but I trust it may make your TS habit much more fulfilling. This is the first article, and you'll be seeing more in issues to come...

Don't let the sight of "Machine Code" in the title scare you off. I am deliberately writing an article that any programmer can use. Most of what I write will be in the form of Machine Code programs that enhance Timex BASIC programming. You don't have to know anything about Machine Language.

This month's little gem is a DATA-READ program. The following routine is very short, but it gives you a very nice simulation of the DATA-READ commands that you find on other computers. Here are some of the specs:

- 1) It is 200 bytes long. 2K computers will be able to use it with memory to spare.
- 2) The routine is 100% relocatable, or may be stored anywhere in memory. It's ideal for Non-Volatile memory.
- 3) Timex format error messages help you use correct syntax.

Let's get down to business...

A machine code program is really only a list of numbers which represent instructions that a microprocessor can understand. Somehow we have to get this list of numbers into the computer's memory. There are many different ways of doing this, and if you have a favorite loader program then feel free to use it. Even so, I encourage you to try out the loader I've included here. It allows you to enter blocks of code to any given memory location. Here are a few reasons why I think it's a very practical loader: 1) It is short and simple, 2) It has a simple error correcting feature, and 3) It gives a visual picture of the contents of memory. While entering a machine code program, it is imperative that the numbers are entered with no errors. That's what makes the last two reasons so important.

It's time to enter the loader program into your computer. If you use mine, then I suggest saving a copy on tape since I will use the same method in succeeding articles. The listing follows:

```
10 PRINT "ENTER START ADDRESS"
20 INPUT A
30 CLS
40 FOR B=A TO A+175
50 PRINT (STR$ PEEK B+" ")(
  TO 4);
60 NEXT B
80 LET B=0
90 LET N=999
100 LET M=9999
110 LET Y=INT (B/8)
120 LET X=(B-Y*8)*4
130 PRINT AT Y,X;"277"
```

```
140 INPUT C
150 IF C<255 THEN POKE A+B,C
160 PRINT AT Y,X;(STR$ PEEK (A+
  B)+"" ")( TO 4)
170 IF C=N AND B>0 THEN LET B=B
  -1
180 IF C<>N AND B<175 THEN LET
  B=B+1
190 GOTO 110
```

With the loader routine entered, you now have the means to store the numbers, but we need to decide where to store them. The easiest place to store machine code, barring non-volatile memory, is in a REM statement. That's the way I'll do it here. Add this line:

```
9999 REM 12345678901234567890123
45678901234567890123456789012345
67890123456789012345678901234567
89012345678901234567890123456789
01234567890123456789012345678901
23456789012345678901234567890123
45678901234567890123456
```

All that really matters is that the line contains exactly 206 characters after the REM. After entering the REM statement, you are ready to RUN the program. I suggest you use the FAST mode.

The first thing the loader does is prompt for a starting address. You should respond with PEEK 16396+256*PEEK 16397-207. This is the address of the text in the REM statement. After entering the address, you will have to wait while the screen fills. When the cursor appears in the top left corner (three inverse question marks), you are ready to start entering numbers. If you enter the first number in the table, the cursor will advance. The entered number will be left in the previously occupied space. Type in all the numbers in the first table, so that the screen looks exactly the same.

If you have decided to save your routine somewhere else in memory, this is for you. Instead of using the PEEK expression for the address, you need to decide upon an address you wish to use. Then, if you are using my loader, you need to subtract six from that address. That is because the first six numbers are not actually a part of the program. They are used to trick the routine into thinking that this particular REM statement is empty. That's important since the program uses REM statements as DATA statements -- it wouldn't do to have the routine being read as data. To you these numbers are unnecessary, so you should skip past the first six before entering anything. You'll find out how to do it later. Working things this way, your screen will still match the table. Only the first six numbers will be different.

If you make a mistake while entering a number, don't worry, you can back up and re-enter the number correctly. To back up one space, enter the letter N. Repeat this until

the cursor is on the offending number. Entering the correct number fixes the error. To get back where you left off, use the letter M. Entering an M advances you one space. This is how non-REM users can skip the first six numbers in the table. Notice that the letters M and N are on the same keys as the > and <. Use this as a simple reminder of which key to use.

After entering the last number in the first table, you'll notice that the cursor doesn't advance. Backing up one space will reassure you that the number is there. When the screen has been thoroughly checked and corrected, break out of the program by typing any letter other than M, N, A, B, C, X, and Y. Using Q for quit is the simplest way to remember how to break. If you break the program accidentally, just RUN it again. The numbers already entered will still be there.

When the first screen has been entered correctly, follow the same process for entering the second table. Non-REM users have no special instructions this time. Just add 176 to the address of the first table to get the address for the second table. For REM users, you need to enter the expression PEEK 16396+256*PEEK 16397-31. Only enter numbers up to where the table stops. This is very important to those using a REM statement; your computer would be very likely to crash if you change numbers further on.

Now that the numbers are all entered correctly, we may go on. You will notice that the REM statement looks very different. It should look exactly like this:

```
9999 REM
A000 USR GOSUB ?2RND5?RNDY REM F
AST GOSUB ? LPRINT C277777?C/
INPUT FOR 6?RNDTAN E(RND+ STEP
?ACS 74?77777?=? ACS ?C?ACS ?4
?7ACS ?/CHR$ YRND?4?54?C?Y LI
ST M RND LPRINT ?N?E?RNDY REM ?C
BY,?C$Y
```

I cannot overstate the importance of having entered the numbers with no errors. When you are absolutely sure that everything is correct, we can move on. This is a word for the wise. When dealing with machine code in REM statements, 'hands off' is the best policy. Although I've been told you shouldn't EDIT them, I've found that you can sometimes change the line number safely. In any case, never move the cursor past the REM. Any alteration of the text will change and ruin the routine it represents. You will also find that a REM statement used to document a REM statement holding machine code is very handy. Later on, when the routine is no longer fresh in your mind, you won't have to run through a stack of old magazines to find out how to use your routine.

The next thing to do is to SAVE the loader program with the complete REM statement. SAVE this a couple of times to be sure that you have a good SAVE. Second, you need to remove the loader program line by line, so that only the REM statement remains. After erasing the loader, SAVE the REM statement on tape. Whenever you want to write a program using DATA-READ, you can LOAD it before writing the rest of the program.

In case you are wondering, there are two reasons for SAVEing the loader and REM statement together. First, if you did happen to let an error slip by, you can edit the REM without having to retype the entire loader. The second reason is similar. As I give you more routines each month, you will undoubtedly find yourself wanting to use more than one routine in a single program. To do this, you will have to have all of the REM statements available in one SAVED program. Each month, then, you will use the loader to enter additional REM statements with different machine code routines in them. Eventually, you will build up a good sized library of useful machine language routines that can be custom picked for a particular application. By SAVEing the loader with the REM statement, you won't have to re-enter the loader next month when you want to expand your library.

Now that we have the program loaded, we can go on to the good stuff. First, I'll give you the instructions on how to use the DATA-READ. Then, I'll give you a very simple example in BASIC which you may or may not find necessary.

First off, we will discuss the DATA statement, or REM in this case. The first rule to remember is that all REM statements will be treated as DATA statements. Data is read, beginning from the smallest line number, sequentially through the whole program. The data itself may be made up of any character except CHR 118, CHR 254, and CHR 26, which are ENTER, REM, and ", respectively. The comma separates individual data items in the REM statement. Consecutive commas represent data equivalent to an empty string. Note that if you wish to use REM statements as documentation, be sure that all the data-REMs precede any documentation-REMs used in the program.

Next on the list is the RESTORE statement. This command sets up the program so it will start reading data from the first REM statement in the BASIC program. You must RESTORE before reading data. If you don't, you will get an error message R/<line number>. RESTORE is accessed by a USR statement. If your routine is stored in a REM statement at the end of a program, the correct syntax is RAND USR PEEK 16396+256*PEEK 16397-201. For those not using a REM statement, the USR should be followed by the beginning address of your routine.

READ also uses a USR statement, but is a bit more involved. All data is assumed to be string data, and can be returned in any string variable. You must specify which string the data is to be returned in by placing a LET <string variable>="" before the READ. Failure to do this results in a \$/<line number> error message. The actual READ statement will be RAND USR PEEK 16396+256*PEEK 16397-169 for those storing the routine in a 9999 REM statement. If you stored the program elsewhere, just add 32 to the address used in the RESTORE statement. If you attempt to READ when there is no more data available, you will get an R/<line number> error message. If your computer runs out of memory while inserting data into the string, you will get the standard 4/<line number> error message.

Since the READ routine returns data in a string, you will need to add one more statement to use numeric data: LET <numeric variable> = VAL <string variable>. While this makes the reading of numeric data longer, it was the simplest and shortest method of writing the routine. Another advantage of using this method is that numeric data may also be represented by any valid mathematical expression easily.

If you were dismayed by the length of the expression after the USR, here is a rather interesting solution. If you define two variables at the beginning of your program, things will look a lot nicer:

```
LET RESTORE=PEEK 16396+255+ PEEK 16397-201
```

```
LET READ=RESTORE+32
```

If you do this, your RESTORE statement will be RAND USR RESTORE. Neat, huh? Likewise, your READ statement would use RAND USR READ.

Note that wherever I used RAND USR <address>, you may use any other valid USR statement. The RAND is not critical to the operation of RESTORE or READ, but it is the easiest way to use the USR function. The only time RAND will cause problems is if you are using RND. In this case, the RAND will effectively destroy the randomness of RND, and you will probably have to use a statement like LET <numeric variable> = USR <address>. Be sure, however, to use a variable that will cause no problems if it is altered.

I have spent a lot of time writing and rewriting this routine, therefore, I am confident in its quality. By using error checking, I have virtually eliminated the possibility of this routine causing a computer crash. Note, however, that you must be extremely careful when entering the RAND USR statement. You must never allow the

address number to be incorrect. If it is wrong, you can almost count on a crash.

Here follows a short program that demonstrates what you can do with this DATA-READ and, also, how to do it:

```
10 REM HELLO,12345,67890,,A+B
20 LET RESTORE=PEEK 16396+255+
PEEK 16397-201
30 LET READ=RESTORE+32
40 RAND USR RESTORE
50 LET A$=""
60 RAND USR READ
70 PRINT A$
80 LET B$=""
90 RAND USR READ
100 LET A=VAL B$
110 PRINT A
120 LET B$=""
130 RAND USR READ
140 LET B=VAL B$
150 LET X$=""
160 RAND USR READ
170 PRINT LEN X$
180 LET X$=""
190 RAND USR READ
200 PRINT X$;"=";VAL X$
9999 REM
A000 USR GOSUB ?RND$?RNDY REM F
AST GOSUB ? LPRINT CE777777?C,
INPUT FOR ?RNDTAN E(RND- STEP
?ACS ?4?77777?/? ACS ?C$ACS ?4
?7ACS ?/CHR$ YRND?4?34?C?Y LI
ST H AND LPRINT ?N?E?RNDY REM ?C
BY,?C$Y
```

If the computer crashes while running this program, you have made an error somewhere along the line. You will need to go back, find it, and correct it. Places to look are in the USR statement and in the machine code numbers.

For those who are genuinely interested, I can provide a complete assembly listing of this DATA-READ routine. The routine logic is thoroughly explained in the listing. Since this listing would be worthless to the 'masses', I have not included it here. If you would like a copy, please send fifty cents with your request. If you don't want the listing, but have questions concerning this routine, just send a self-addressed stamped envelope to:

Kevin R. Bulgrien
LeTourneau College #1014
P.O. Box 7001
Longview, TX 75607

Tune in next month for another exciting episode of 'Machine Code for the Masses'...

TABLE 1, ADDRESS: PEEK 16396+255
*PEEK 16397-207

118	39	16	0	202	212	2037	91
119	84	206	126	84	206	304	700
120	80	206	406	12	30	3034	700
121	70	306	100	40	4	9	24
122	206	34	123	34	201	40	16
123	206	0	106	234	106	37	30
124	206	4	206	111	206	7	30
125	206	7	30	24	206	1	30
126	206	3	40	13	206	110	30
127	206	3	126	40	206	1	30
128	206	3	24	214	206	4	16
129	206	1	184	30	206	106	40
130	206	2	206	0	206	206	106
131	206	4	106	34	206	206	106
132	206	0	206	106	40	206	206
133	206	4	13	206	106	206	206
134	206	0	206	206	206	206	206
135	206	4	206	206	206	206	206
136	206	0	206	206	206	206	206
137	206	4	206	206	206	206	206
138	206	0	206	206	206	206	206
139	206	4	206	206	206	206	206
140	206	0	206	206	206	206	206
141	206	4	206	206	206	206	206
142	206	0	206	206	206	206	206
143	206	4	206	206	206	206	206
144	206	0	206	206	206	206	206
145	206	4	206	206	206	206	206
146	206	0	206	206	206	206	206
147	206	4	206	206	206	206	206
148	206	0	206	206	206	206	206
149	206	4	206	206	206	206	206
150	206	0	206	206	206	206	206
151	206	4	206	206	206	206	206
152	206	0	206	206	206	206	206
153	206	4	206	206	206	206	206
154	206	0	206	206	206	206	206
155	206	4	206	206	206	206	206
156	206	0	206	206	206	206	206
157	206	4	206	206	206	206	206
158	206	0	206	206	206	206	206
159	206	4	206	206	206	206	206
160	206	0	206	206	206	206	206
161	206	4	206	206	206	206	206
162	206	0	206	206	206	206	206
163	206	4	206	206	206	206	206
164	206	0	206	206	206	206	206
165	206	4	206	206	206	206	206
166	206	0	206	206	206	206	206
167	206	4	206	206	206	206	206
168	206	0	206	206	206	206	206
169	206	4	206	206	206	206	206
170	206	0	206	206	206	206	206
171	206	4	206	206	206	206	206
172	206	0	206	206	206	206	206
173	206	4	206	206	206	206	206
174	206	0	206	206	206	206	206
175	206	4	206	206	206	206	206
176	206	0	206	206	206	206	206
177	206	4	206	206	206	206	206
178	206	0	206	206	206	206	206
179	206	4	206	206	206	206	206
180	206	0	206	206	206	206	206
181	206	4	206	206	206	206	206
182	206	0	206	206	206	206	206
183	206	4	206	206	206	206	206
184	206	0	206	206	206	206	206
185	206	4	206	206	206	206	206
186	206	0	206	206	206	206	206
187	206	4	206	206	206	206	206
188	206	0	206	206	206	206	206
189	206	4	206	206	206	206	206
190	206	0	206	206	206	206	206
191	206	4	206	206	206	206	206
192	206	0	206	206	206	206	206
193	206	4	206	206	206	206	206
194	206	0	206	206	206	206	206
195	206	4	206	206	206	206	206
196	206	0	206	206	206	206	206
197	206	4	206	206	206	206	206
198	206	0	206	206	206	206	206
199	206	4	206	206	206	206	206
200	206	0	206	206	206	206	206
201	206	4	206	206	206	206	206
202	206	0	206	206	206	206	206
203	206	4	206	206	206	206	206
204	206	0	206	206	206	206	206
205	206	4	206	206	206	206	206
206	206	0	206	206	206	206	206
207	206	4	206	206	206	206	206

TABLE 2, ADDRESS: PEEK 16396+255
*PEEK 16397-31

136	40	20	42	20	64	43	197
137	206	106	9	226	193	43	112
138	113	36	36	236	206	237	176
139	206	34	123	64	201		

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PHONE _____

ZX81 HARDWARE & SOFTWARE NEWS
by Peter McMullin

Howdy, folks. Many of us just don't have much time for hacking around with our computers in the summer months, but that doesn't mean everything stops! I've heard several people say "the ZX81 market is dead" lately. Upon examining the current selection of ZX81/TS1000 software & hardware ads in T-S HORIZONS, SYNCWARE NEWS, and other magazines & newsletters, I'd say the afore-mentioned people must have their heads up at some dark hole. The pickings are still rich: I've never seen a livelier "dead" computer!

ZX81 DISK SYSTEMS:

If you're a serious ZX user, the thought of getting a disk interface must have crossed your mind at some point. You can pick up perfectly good (used) SSDD floppy drives these days for \$90.00 or less, and new slimline DSDD drives can often be had for under \$169.00. Cases, often with power supplies intact, can be picked up at ridiculously cheap prices from several surplus parts suppliers.

I recently picked up a used TEAC drive with case and power supply, and decided to take the plunge.

Larken Electronics, R.R. # 2, Navan, ONT Canada K4B 1H9 has been advertising a disk controller card and DOS for the ZX81 and 2068, supporting standard Shugart SA455 compatible drives, for the incredible price of \$119.00 CAN.

I promptly phoned Larken, only to find that while the 2068 version is indeed available from stock, the ZX81 version has not yet been debugged. It could be ready in a few weeks, or months. If you send a stamped SAE to Larken, they'll notify you when the ZX version is ready to deliver. It stands as the least expensive disk controller being offered for the ZX - when it becomes available.

Severely bitten by the "disk bug", I decided "Hang the budget...I want a disk system NOW!". A phone call to COMPUSA revealed that they are no longer manufacturing their ZX81 Floppy Disk system, although Tom Bent tells me that E-Z KEY, in Quincy, Mass., still has COMPUSA systems available for \$430.00 (Complete System). The COMPUSA DOS is noted for its friendliness, but it is an expensive system. After ruling out the COMPUSA choice, I got in touch with...

AERCO, 7606 Robalo Road, Austin TX 78757

AERCO is the "pioneer" producer of disk systems for Sinclair computers. A phone call to Jerry at AERCO answered all my questions, and made a very positive impression. The AERCO system is sold as modular components, which is great for someone who already has floppy drives & power supplies. The Controller card & DOS is \$179.00 U.S. with Centronics interface built in. Add \$5.00 per order for shipping.

After all this research, I decided to order the AERCO system. I expect it to arrive any day, and will have a detailed report on my initial adventures with the AERCO system in my next column. I haven't forgotten the LARKEN system, in fact I intend to get one when they're ready, and print a comparative review of the AERCO & LARKEN products.

OLIGER/KINGSLEY:

While on the disk subject, it is worth noting that John

Oliger is nearing completion of his disk system for the 2068, with Ray Kingsley of SINWARE writing the DOS. 2068ers are awaiting this one with bated breath: the results of the Oliger/Kingsley team-up are bound to be top-notch. John has indicated that his disk controller card will work on the ZX81, and that Ray "might write a DOS for it if there is a big enough demand". If you are prepared to wait for a while, but would like to see an Oliger/Kingsley disk system for the ZX81, then write to Ray Kingsley, c/o SINWARE SOFTWARE, P. O. Box 8032, Santa Fe, NM 87504, U.S.A., and give Ray your encouragement!

CP/M?

A couple of years ago, AERCO was advertising a "full-blown CP/M 2.2" for the ZX. In my conversation with Jerry, I asked him what ever happened to this. His answer, in a nutshell, was yes, the CP/M setup does exist, and is available if you want it. However, it was considered impractical because very little CP/M software could be run on the 32-column screen.

Recently I have heard suggestions that at least one company was planning an 80-col. video card for the ZX just prior to the TIMEX dropout. If ANYONE has ANY info about an 80-col. video card that might be married to the AERCO ZX-CP/M machine, please drop me a line and let me know.

SINC-ARTIST 1.3:

CALLISTO SOFTWARE
924 2nd Street East
Saskatoon, SASK
Canada S7H 1R1

...has some incredible software available these days. Sinc-Artist 1.3 is a program which is very similar to Zebra Systems' Tech-Draw for the 2068. S-A lets you create pictures with 256*192 resolution, for output on a 2040 printer. The screen is a 48*64 pixel window on the hi-res picture, and scrolls around freely over the picture. The program has 40 different (redefinable) fill patterns, pencil and brush "draw" modes, a complete selection of shapes and filled shapes, including circles, rectangles, triangles, quadrilaterals; lines, rays, automatic horizontal or vertical area filling, and opaque or transparent draw modes. The picture can be printed out as normal COPY size, or in 4 strips which make a 11.5"x13" poster. The program has a friendly, interactive menu system, and is written completely in machine code. Pictures can be Saved. Sinc-Artist is \$11.95 CAN. + \$2.00 shipping from Callisto.

I was so knocked out by Sinc-Artist, I really wanted to be able to print the pictures out via Centronics interface, to my 80-col. dot matrix printer. The author of S-A, James Hastings-Trew, has supplied me with all the info required to do this. I am planning to write fullsize printer routines for S-A, for use with any printer I/F and fullsize dot matrix printer. The 2040 will still be supported, but those with big printers will be able to print pictures out in 3 different sizes, from 4"x5" to 21"x30". This will take awhile - maybe in time for Christmas.

ZX HI-RES:

Callisto also sent me a sample/demo of a very impressive software Hi-Res for ZX81. ZX Hi-Res gives you upper & lower case on screen, very credible 128*192 plotting resolution, and a toolkit of graphics routines

nearly comparable to those provided by Sinc-Artist. The program is not yet commercially available, and user documentation has not been written. If you're interest, write to Callisto & let James know.

James Hastings-Trew mentioned that he has also written some neat graphics-toolkit stuff for the TMS9918 VDP, which will surely be of interest to JLO Video Upgrade owners. James has a Kolorworks board for his ZX, which also uses the TMS9918. The VDP port addresses (and perhaps some other details) would have to be modified for the Oliger system, but based on the quality of the other Callisto offerings, I suspect it will be well worth the effort.

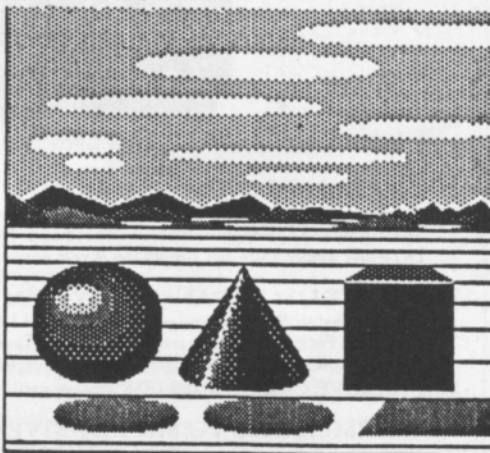
TIDBITS:

...Paul Hunter's series on BANK SWITCHING, originally published in T-5 HORIZONS, is now being carried in revised form by the Triangle Sinclair User's Group

Newsletter. Never a better time to join the Triangle group - write c/o Doug Dewey, 206 James Street, Carrboro, NC 27510. Subscription/Dues are \$10.00 U.S. per year, and well worth it.

...You can virtually eliminate crashes due to connector wobble, just by keeping those contacts CLEAN! Use pure Freon TF (sold as "professional" tape head cleaner at Radio Shack) with a Q-Tip to clean all con- tact surfaces periodically. A good (NON-SILICONE!) contact cleaner/preservative, such as CRAMOLIN, mixed with the Freon, works miracles. I use this stuff, and haven't had a connector-related crash in months.

...I leave you with a sample picture created using SINC-ARTIST 1.3. This picture was originally printed out on a 2040 printer in poster size, then photographically reduced to what you see here. TSH



15

```
*****
* 2068      PERSONAL ASSET MANAGER 2068 *
*****

Menu driven program lists up-to 18 assets, 30 displays.
PORTFOLIO (Fast display, Fast updating, Program
calculates current value @ net worth, annualized
cap. gains & dividends).
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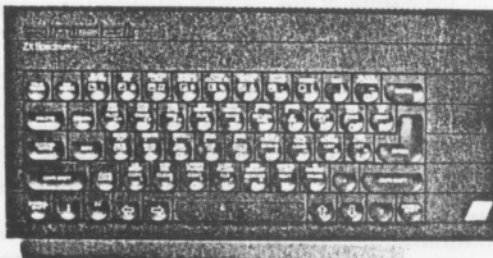
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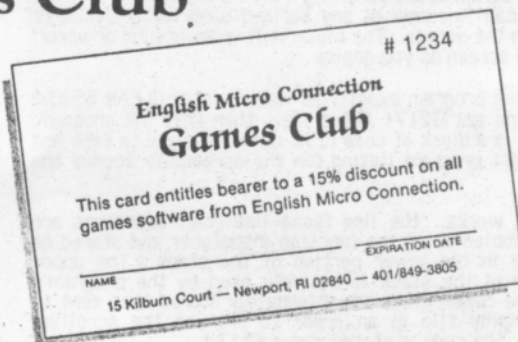
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by: C. Vernon Tidwell

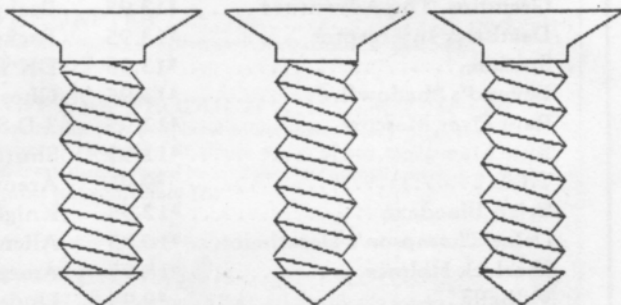
Vern Tidwell, 1303 Whitehead, Key West FL 33040. TSH

[illegible]

```

16 PRINT "The lines are number
red from 0 to 175 (from bottom to
top). The columns are numbere
d from 0 to 31 (left to right).
": GO SUB 100
18 PRINT "YES or NO: INPUT
y or n"
20 LET Z$="": INPUT "SCROLL UP
": Z$: IF CODE Z$=121 THEN LET
S=65333: PRINT AT 18,0;"SCROLL U
P": GO TO 24
22 PRINT AT 18,0;"SCROLL DOWN"
: LET S=65350
24 LET Z$="": INPUT "WRAP-AROU
ND": Z$: IF CODE Z$=121 THEN LE
T W=65138: LET Z=65203: PRINT AT
19,0;"WRAP-AROUND": GO TO 28
26 PRINT AT 19,0;"NON-WRAP": L
ET W=65135: LET Z=0
28 PRINT AT 21,0:" PRESS ANY
KEY TO TEST SCROLL": PRINT #0;"W
HEN DONE WITH TEST, PRESS ENTER"
: PAUSE 0: GO SUB 9310
30 PRINT "NOTE: Save Code & R
eload With CLEAR 65134: LOA
D "CODE Access This Code W
ith Lines SuchAs The Following O
r Use Examples In The Demonstrati
on. The USR Values Can Vary; J
ot Them Down For Reference."
32 PRINT : IF W=65138 THEN PRI
NT "9994 RANDOMIZE USR 65203"
34 IF S=65333 THEN PRINT "9995
RANDOMIZE USR 65333"
36 IF S=65350 THEN PRINT "9995
RANDOMIZE USR 65350"
38 PRINT "9996 Your Program To
Scroll Goes Here"
40 IF W=65138 THEN PRINT "9997
RANDOMIZE USR 65138"
42 IF W=65135 THEN PRINT "9997
RANDOMIZE USR 65135"

```



Demo program simulates a turning screw (above) and screen sections scroll up and down under keyboard control (below).

```

44 PRINT "9998 IF INKEY$ = ""
" THEN GO TO 9997"
46 PRINT AT 18,0;"1) SAVE ""CODE 65135,232"";"2) Return
To Program Menu"
48 PRINT #0;TAB 5;"PRESS 1 OR
2 AS DESIRED"; PAUSE 0: IF CODE
INKEY$=50 THEN CLS : GO TO 10
50 RANDOMIZE USR 2217: SAVE "C
ODE"CODE 65135,232: BEEP .1,30:
GO TO 43
100 POKE 23617,236: INPUT "ENTE
R TOP LINE = ";Y: IF Y<=175 AND
Y>=0 THEN PRINT "TOP LINE = ";Y:
GO TO 102
101 BEEP .2,10: GO TO 100
102 INPUT "ENTER BOTTOM LINE =
";B: IF B<=Y AND B>=0 AND B<=175
THEN PRINT "BOTTOM LINE = ";B:
GO TO 104
103 BEEP .2,10: GO TO 102
104 INPUT "ENTER LEFT COLUMN =
";X: IF X>=0 AND X<=31 THEN PRIN
T "LEFT COLUMN = ";X: GO TO 105
105 BEEP .2,10: GO TO 104
106 INPUT "ENTER RIGHT COLUMN =
";A: IF A>=X AND A>=0 AND A<=31
THEN PRINT "RIGHT COLUMN = ";A:
GO TO 108
107 BEEP .2,10: GO TO 106
108 RESTORE 1016: LET X=X*8: LE
T A=A+1-(X/8): FOR N=1 TO 5: REA
D C: POKE C,B-1: NEXT N
110 LET COLS=INT (A AND A<=(256
-X)/8): POKE 65158,COLS: POKE 65
187,COLS: POKE 65345,Y+1: POKE 6
5354,Y+1
112 LET COORD=256*(Y+1)+X: LET
C=COORD/256: POKE 65140,INT C: P
OKE 65288,INT C: LET C=(C-INT C)
*256: POKE 65139,INT C: POKE 652
87,INT C
114 RETURN
1000 REM POKE MC TO ABOVE RAMTOP
1002 FOR N=65135 TO 65217: READ
C: POKE N,C: NEXT N
1004 FOR N=65218 TO 65281: POKE
N,0: NEXT N
1006 FOR N=65282 TO 65366: READ
C: POKE N,C: NEXT N: RETURN
1008 DATA 205,179,254,1,0,176,33
,0,96,5,120,254,255,200,197,205,
44,255,229,17,194,254,1,32,0,197
,237,176,193,209,33,226,254,237,
176,209,193,5,120,254,255,200,19
7,235
1010 DATA 205,44,255,229,17,226,
254,1,32,0,197,237,176,193,209,3
3,194,254,237,176,225,193,24,197
,33,225,254,1,33,0,13,200,197,35
,54,0,193,24,247
1012 DATA 1,0,96,197,1,0,176,5,1
20,254,255,40,27,197,205,29,255,
193,209,235,115,35,114,35,229,24
,236,33,0,0,229,229,33,87,0,229,
205,0,98,201,193,201,94,35,86,35
,193,229,235,197,201
1014 DATA 33,8,255,54,255,35,54,
4,33,12,255,54,176,205,2,255,201
,33,8,255,54,176,35,54,5,33,12,2
55,54,255,205,2,255,201
1016 DATA 65147,65175,65292,6533
7,65362
9100 REM Demonstration Program
9101 CLS : PRINT AT 5,5;"DEMONST
RATION PROGRAMS"";" #1 Scroll U
p With Wraparound"";" #2 Scroll
Up & Down (Non-Wrap)"";" #3 Scro
ll Down With Wraparound"";"Pres
s ENTER to Exit Each Display": P
AUSE 0: LET Y=140: LET X=12: LET
A=20: LET B=20: GO SUB 108: PAP
ER 0: BORDER 0: INK 7: CLS
9110 RANDOMIZE USR 65203: RANDOM
IZE USR 65333

```

19

```

9111 PLOT 100,142: DRAW 0,8: DRA
W -40,20: DRAW 140,0: DRAW -40,-
20: DRAW 0,-8: PLOT 100,19: DRAW
60,0: DRAW -30,-19: DRAW -30,19
: FOR N=4 TO 14 STEP 2: PLOT 100
,N*10: DRAW 60,-10: PLOT 110,(N*
10)-10: DRAW 40,-10: NEXT N: PLO
T 100,141: DRAW 60,0
9112 PLOT 100,20: FOR n=1 TO 6:
DRAW 10,10: DRAW -10,10: NEXT n:
PLOT 150,20: FOR n=1 TO 6: DRAW
10,10: DRAW -10,10: NEXT n
9113 RANDOMIZE USR 65138: IF INK
EY$="" THEN GO TO 9113
9200 CLS : FOR N=1 TO 50: PRINT
"GOOD MORNING! ";: NEXT N: PRINT
#0;TAB 9,"Use Arrow Keys"
9202 IF INKEY$="6" THEN RANDOMIZ
E USR 65350: GO TO 9206
9203 IF CODE INKEY$=13 THEN GO T
O 9210
9204 IF INKEY$="7" THEN RANDOMIZ
E USR 65333: GO TO 9208
9205 GO TO 9202
9206 IF INKEY$="6" THEN RANDOMIZ
E USR 65135: GO TO 9206
9207 GO TO 9202
9208 IF INKEY$="7" THEN RANDOMIZ
E USR 65135: GO TO 9208
9209 GO TO 9202
9300 LET Y=103: LET X=6: LET A=2
6: LET B=72: GO SUB 108: LET Z=6
5203: LET W=65138: LET S=65350
9310 CLS : FOR N=1 TO 117: PRINT
"HELLO ";: NEXT n: IF Z<>0 THEN
RANDOMIZE USR Z
9312 RANDOMIZE USR 5
9313 RANDOMIZE USR W: IF INKEY$=
"" THEN GO TO 9313
9314 PAPER 7: BORDER 7: INK 0: C
LS : RETURN
9992 SAVE "BYTEMAP": BEEP .1,30

```

TSH

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'THE WIZ' ACCOUNTING SYSTEM - \$ 69.95

FINALLY!!! Accounting programs offered only before on expensive computers are now available for small business use on the 2068. 'THE WIZ' -- Payroll, Merchandise Inventory, Accounts Payable, Accounts Receivable, & General Ledger -- is the solution to pain-staking paperwork. With this computerized accounting system, inputs are entered into data fields, therefore, data entry is quick, easy, and completely error-free. Since all programs are written in BASIC, modification, if needed, is simple.

PAYROLL: Hourly and vacation pay; Print YTD and weekly deductions, gross, and net pay; Company and individual employee summaries; Check print routine.

INVENTORY: Up to 300 items; Log of sales & purchases; Lprint price tags, sales, returns, and inventory file; Re-order #; Sort by item, lot, or vendor #'s. Also, load & save item lists.

ACC. REC.: Up to 200 accounts; transaction summaries; interest calculation; Lprint customer file and transaction summaries. Also, load & save customer lists & balances.

ACC. PYB.: Up to 200 vendors; transaction summaries; Lprint vendor list, transactions, and purchase totals. Also, load & save vendor lists and balances.

LEDGER: Produces trial balance, chart of accounts, current transactions, and updated balances. Also, load & save updated balances. Auto-post totals from Payroll, Inventory, Payables, and Receivables.

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SPECTRUM CONVERSION NOTES THE SPECTRUM EXPANSION CONNECTOR by Jack Keene

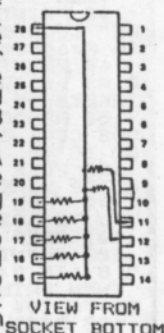
One of the first questions asked after the ROM conversion is made on the 2068 is "can I run peripherals designed for the Spectrum?"... the answer is maybe yes, maybe no. The first thing we must look at is just how the Spectrum makes its connection. The following is the expansion connector from the viewpoint of the 2068 with its parallel point on the Spectrum: (aligned on the slot)

NON-COMPONENT SIDE 2068 EDGE CONNECTOR #		COMPONENT SIDE 2068 EDGE CONNECTOR #	
2068	SPECTRUM	2068	SPECTRUM
GND	1 --	GND	1 --
SPK/TAPE OUT	2 A14	EAR	2 A15
+15V	3 A12	A7RB	3 A13
+5V	4 +5V	D7	4 D7
NC	5 +9V	DZ IN (NC)	5 NC
SLOT	6 SLOT	SLOT	6 SLOT
PWR GND	7 0V	D0	7 D0
PWR GND	8 0V	D1	8 D1
CLK	9 CLK	D2	9 D2
A0	10 A0	D6	10 D6
A1	11 A1	D5	11 D5
A2	12 A2	D3	12 D3
A3	13 A3	D4	13 D4
A15B	14 IORQGE	INT	14 INT
A14B	15 0V	NMI	15 NMI
A13B	16 VIDEO	HALT	16 HALT
A12	17 Y	MREQB	17 MREQ
A11	18 V	IORQB	18 IORQ
A10	19 U	RDB	19 RD
A9	20 BUSRQ	WRB	20 WR
A8	21 RESET	BUSACK	21 -5V
A7	22 A7	WAIT	22 WAIT
A6	23 A6	BUSRQ	23 +12V
A5	24 A5	RESET	24 12V unsmooth
A4	25 A4	MI	25 MI
DZ OUT (NC)	26 ROMCS	RFSHB	26 RFSH
R	27 BUSACK	EXROM	27 AB
G	28 A9	ROSCOS	28 A10
B	29 A11	BE	29 NC
BUS ISO (NC)	30 --	IOAS	30 --
VIDEO	31 --	SOUND	31 --
GND	32 --	GND	32 --

As you can see the things that do match are D0-D7, A0-A7, +5v, and most of the Z80 control line. There are a few of the lines that are buffered on the 2068 (indicated by a B at the end of the label) but not on the Spectrum. In most cases this buffering makes no major difference. A second look reveals that the 2068 makes a nearly complete match with the ZX81 family with the exception of the +9v line. However, the Spectrum did not follow this convention as a number of address lines are moved around plus added voltages make a significant difference.

There is one hidden but major difference in the data lines that is also significant. In both the Spectrum and ZX81 each data line has a 10kohm pullup resistor to the +5v supply. What this means is that in some software that uses interrupts that the data lines will not be properly configured. This is a limited amount of software and generally will not be of any major importance. It may effect some hardware operation. The fix is simple enough. In the 2068 the easiest place to add the pullup resistors is the EXROM socket (that is the other

socketed chip located above the cartridge connector toward the rear of the computer). This can be accomplished by taking the EXROM from its socket and adding another socket (I would recommend a low profile machine pin type) which has been modified by adding either individual resistors (1/8 watt only will fit) or a SIP resistor network to the underside as illustrated. A pullup resistor is not added to D2 as there is already one in the 2068. After making the mod to the socket (take care to keep the resistors close to the socket) plug it into the EXROM socket in proper orientation and reinsert the EXROM. This should have no effect on 2068 or Spectrum operation. At this point this data line mod is not known to be incorporated on the Romswitch, EMU, or SWITCHBOARD. Check your unit to verify. You may find it simpler to add a SIP resistor network directly to the data lines of one of those conversion units. This is the fix that is necessary to let at least one piece of software run (Chequered Flag from Pision) and may fix others. I reiterate that this only impacts a limited amount of software.



This article is intended only to provide an overview of the Spectrum bus and as a starting point for your own consideration of peripherals that you are considering purchasing from England. It would appear possible with a little work to make an adapter to get things in order as most voltages could be derived from the +15 volt supply. Y, V, U signals are video signals...luminance/sync, red-yellow, and blue-yellow respectively. IORQGE is a variant of IORQ. With A0-A7 in line and D0-D7 squared away most devices at ports up to 255 should work providing that the power is derived from the +5v line. It is best to proceed with caution and I would appreciate any input that you might add to these notes.

And now for a few notes on recommended reading for those that might be interest in hardware (either build your own or purchased).

SPECTRUM HARDWARE MANUAL by Adrian Dickens, Published by Melbourne House. This book packs into 124 pages just about all you could want to know about the Spectrum machine up through Issue 3. Includes schematics and parts list with a good explanation of the inner workings of the machine. Plans are included for Centronics interface, joystick, and A/D converter. I would even recommend it to those without Spectrum conversion as the technical similarity to the 2068 machine is sufficient to be helpful. A MUST BOOK for your library if hardware is your thing. Available from Zebra Systems, 78-06 Jamaica Avenue, Woodhove, New York 11421 for \$14.95 plus \$3.00 P&H.

EASY ADD ON PROJECTS FOR YOUR SPECTRUM, ZX81 & ACE by Owen Bishop, Published by Bernard Babani. This little book is well worth the \$6.50 plus \$.75 P&H as a starting point for a number of hardware projects for the ZX variant machines. As the projects are described in thorough detail with clear illustrations. Some of the projects detailed are a picture digitizer, light pen, a weather station and more. Most of the components listed are available here or at least their equivalents. Available from Electronic Technology Today, Inc., P. O. Box 240, Massapequa Park, NY 11762-0240.

That's all for this time. If you have any comments or additions, I'm always glad to hear them.

Jack Keene
3515 Ingleside Drive
Dallas, Texas 75229

S

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U

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M

TS 2068

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2068 REVIEWS



REVIEW: The WIZ

by
Bill Ferrebee

PRODUCT: The WIZ

DESCRIPTION: Accounting Software

COMPUTER: 2068 (printer optional)

PRICE: \$69.95 (cassette)

AVAILABLE FROM: S.B.C. SOFTWARE
17835 North Wind
Fraser, MI 48026

I've always known that the TS2068 was a great computer to use for small business applications. Word Processors...DataBases... Spreadsheets... and now... a complete Accounting System.

"The WIZ" consists of 5 "modules":

- Accounts Payable
- Accounts Receivable
- General Ledger
- Merchandise Inventory
- Payroll

All five programs are menu driven, fully documented and where necessary, files can be transferred between programs (ex: Files generated with Payroll can be used to update the General Ledger).

"The WIZ" is what I will term "software dependent". That is, to properly use "The WIZ" you must have a copy of "TASWIDE", the 64-column utility program from Tasman Software. (TASWIDE is available from Zebra Systems and many other T/S software dealers.)

Steve Cermak, author of "The WIZ", designed a majority of this software using a 64-column screen. (Examples accompany this review.) This enables full use of the screen, and keeps splitting of information to a minimum.

Now, my opinion of "The WIZ": Very good software!

"The WIZ" gives you the five most used applications in any business environment. The programs are very "user friendly", and the documentation is easy to understand.

Output can be made to either a 2040 Thermal Printer, or a full-size printer, with the proper driver software.

"The WIZ" gives you just what you need to properly run your small business or household financing needs on the 2068.

```
*****
* MERCHANDISE INVENTORY *
*****
```

WHAT TYPE OF PRINTER

(a) 2040 printer, or (b) 80-column

© 1984, Steve Cermak - S.B.C. SOFTWARE

Select MENU option.

MENU

- 1 Input item.
- 2 Sales/ Returns/ Add inv.
- 3 (L)Print options.
- 4 Check for re-order.
- 5 Change re-order N.
- 6 Delete Item.
- 7 Sort Master File.
- 8 SAVE transaction data.
- 9 LOAD/SAVE item file.

ENTER LOT ITEMS: (enter item # 99999 to exit)

Item #: -----

Lot #: -----

Vendor #: ---

Date: ---/---/---

Lot quantity: -----

Unit cost: -----

Units added to stock: -----

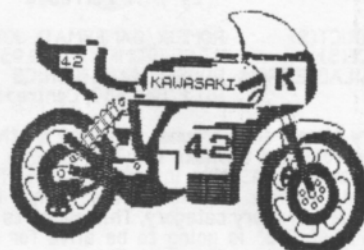
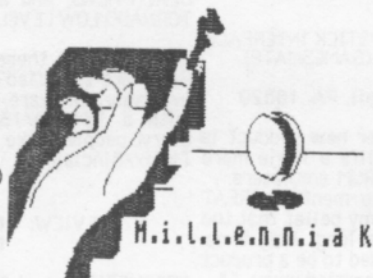
Units back-ordered: ----

Re-order #: -----

REVIEW: ARTWORX

by
Bill Ferreebee

PROGRAM: ARTWORX
DESCRIPTION: Graphics
COMPUTER: 2068 (Printer Optional)
PRICE: \$19.95
AVAILABLE FROM: RAMEX
17620 26 Mile Road
Washington, MI 48094



Well, here I go again! Another graphics program... but WHAT A PROGRAM!

David Ridge pulled out all the stops on ARTWORX. It has about every feature you would need in a program of this nature.

All work, with the exception of entering of text, is done with a joystick. To select a command from the Main Menu, which is available at any time, you simply move the cursor over the first letter of the command you want.

Many of the basic commands that you expect to see are there: Draw - Brush - Circle - Erase - Ink - Paper - etc. But, there are also some ADVANCED commands: Duplicate - Relocate - Magnify - Compress - Mirror - just to name a few.

Brushstrokes can be made from 1 to 4 pixels wide, and ink and paper colors are easy to change at any time.

A spraybrush command is available besides the normal Fill. For text needs, four separate fonts are available, and they can be placed anywhere on the screen.

Screens can be saved to tape for later use, or for completion at a later date. Also, any SCREEN\$ you may have (cover screen for a game, for example) can be loaded into this program for modification.

Included with ARTWORX is a utility program called ARTWORX GALLERY. This program enables you to store up to 5 screens into the computer and display them in sequence. The sequencing command can be made fast enough to allow animation.

(The examples shown with this article were made with ARTWORX. Because it is a color programs, these examples can not truly show the full capabilities of this program.)

From what I have seen from David Ridge, he has an excellent programming style. David is a strong believer in "User Friendly" software, and he provides as many features as possible in his programs. Considering both the wealth of features AND low price of ARTWORX, I feel it would be a recommended addition to the software library of any artistically inclined computerist. TSH

COMMENT ON:
GRAPHIC PROGRAMS
by Bill Ferreebee

In these past months, I have reviewed a number of graphic programs for the TS2068. I believe that to get a full appreciation for this computer, a graphic program is a definite asset. You have before you a machine capable of High-Resolution graphics, 16 colors, and with UDGs, you are limited only by your imagination.

But just because you purchase that graphic program does not mean you will become an instant Picasso or Rembrandt. No program on the market can do that. If it could, then true art would be a thing of the past.

It will take some time with a program before you will begin to get results you feel are good. If you are artistically inclined, then it will take less time. But, if you are not, don't despair! You will be surprised how well you will be able to create if you keep patient.

First, get as familiar as possible with the program. Read the manual COMPLETELY, and refer to it often... you will find it getting easier each time.

Next, don't set impossible goals to start with. Try creating something simple and perfect it. Then get a little more advanced.

Finally, and most importantly, don't be afraid to experiment! Try your ideas. If they don't work the way you expected, "go with the flow". You never know, the picture you call a "mistake" may end up being a true piece of art!

Graphic programs can provide hours of enjoyment and satisfaction...if you go at them in the right "frame" of mind. TSH

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I. AUERSBACHER, M.S.
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**REVIEW: Products from RUSSELL ELECTRONICS
by Bill Ferrebee**

PRODUCT(S): ROMFIX, GAMESMATE JOYSTICK INTERFACE
PRICE(S): \$3.25 (ROMFIX), \$19.95 (GAMESMATE)
AVAILABLE FROM: RUSSELL ELECTRONICS
RD 1 Box 539, Centre Hall, PA 16820

Every time I turn around, it seems another new product is being released to make the T/S owner's life a little more enjoyable. Disk drive interfaces. . . SPECTRUM emulators. . . Graphic Tablets. . . Microdrives. . . not to mention GREAT software in every category. This supports my belief that the "spirit of T/S" is going to be alive for a long, long time. ("Off the soapbox, Ferrebee! This is supposed to be a product review" . . . Oh, sorry! I guess I got a little carried away...")

One of the leaders in this product development is RUSSELL ELECTRONICS. Located in Central Pennsylvania, Bill and Gerry Russell have brought us such great T/S products in the past as:

- the "Winky Board" (load filter)
- the "S.R.S." (Speech Recognition System)
- amazing utility software (such as ZXLR8)
- the ROMSWITCH (Spectrum emulator)

and, of course:

The introduction of the ROMSWITCH, and other Spectrum emulators, has opened a whole new world of great software to 2068 owners. The British 2068 counterpart is still a very popular machine and tons of new software is being released daily.

I personally prefer using the ROMSWITCH over other emulators because of the ease of its use. After the ROMSWITCH is installed inside your 2068 (easily done), it is very easy to switch from 2068 to Spectrum and back. The original ROMSWITCH (which I have) runs practically all Spectrum software. However, there are some programs that would not work with it. The problem was diagnosed by Russell, and a new improved ROMSWITCH was developed.

For those of you that have an original ROMSWITCH, fear not. A very inexpensive ROMFIX is available that upgrades your emulator to the specifications of the new board. ROMFIX is basically an IC socket, fitted with some resistors. To install, you open your 2068 (just this one last time!), remove another chip, and place this socket between the chip and the original socket. It is great to be able to run ALL Spectrum software on the 2068. (By the way, Russell also has a Spectrum HARDWARE Adaptor available that allows you to run Sinclair Microdrives and other Spectrum hardware with the ROMSWITCH.)

The other new product is one that will enable you to enjoy your favorite Spectrum games even more... Because of hardware differences between the 2068 and Spectrum, the joystick ports can not be used for Spectrum software.

Enter Russell to the rescue...with the GAMESMATE Joystick Interface. This consists of a PC board that plugs into the Cartridge Dock of the 2068. It contains a couple of ICs and an Atari-compatible joystick port.

If you have a ROMSWITCH installed in your 2068, you can simply plug your joystick into this adaptor, and play any software that has a KEPSTON joystick option. The KEPSTON seems to be the most popular joystick interface in England, which is why Steve Wyatt, designer of the GAMESMATE, based it on Kepston specifications.

I love this thing! I immediately doubled my score on BEACH-HEAD, and actually made it through a full run on TORNADO LOW LEVEL.

Even with all these great products, do you think Bill and Gerry are satisfied? NO WAY! Very soon, Russell will have available software that will generate COLOR on a B&W TV with a TS1000/1500! Keep up the good work Bill and Gerry...people like you make me proud to own a Timex/Sinclair!

TSH

**REVIEW: MORE EDUCATIONAL GAMES
by Bill Ferrebee**

PRODUCT(S): Logic Levels, Number Tumblers, Up & Add 'Em (Fisher-Price)
DESCRIPTION: Alphabet Zoo, Aegean Voyage (Spinnaker)
COMPUTER(S): Educational Games
PRICE: Spectrum/TS2068
PRICE: \$15.95
AVAILABLE FROM: GAMES TO LEARN BY

A few issues ago (Issue #11), I reviewed a number of educational programs from Spinnaker Software, a leader in the field. Marty DuBay of GAMES TO LEARN BY provided me with another set of programs to review, and I wasn't disappointed this time, either. Of the five programs she sent me, two were Spinnaker titles, and the other three came from the Fisher-Price line. By the way, Fisher-Price software is written by Spinnaker, so I anticipated the quality would be as good. All five titles were excellent in design, each taught a useful skill, and most important...they were FUN!

-ALPHABET ZOO is designed for 3 to 8 year-olds. Through the use of maze games, the child learns recognition skills as they associate letter with the pictures they see.

-AEGEAN VOYAGE is designed for older children, ages 8 to adult. It helps to develop deductive reasoning skills, and also introduces the user to many characters and places in Greek Mythology.

-LOGIC LEVELS helps children, ages 7 to 12, learn to predict the outcome of a series of actions, and encourages quick decision making. Again, this is done through a maze-type game.

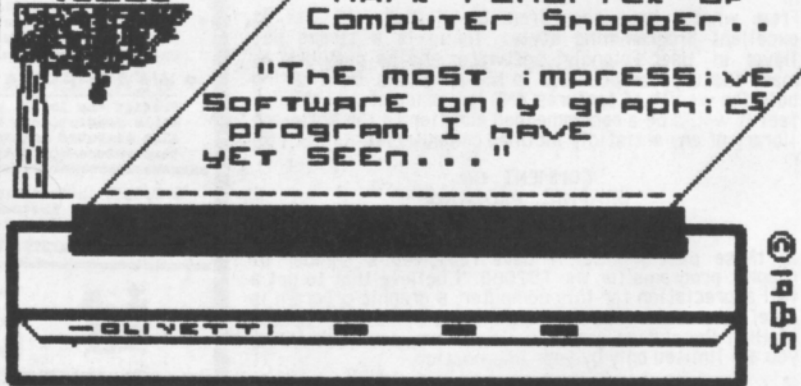
-NUMBER TUMBLERS is an arcade-type game for 8 to 12 year-olds to sharpen their basic math skills. The player uses cute characters called Wumble Chums to make this game fun to play.

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UP & ADD 'EM is a very good first program for your child. It is designed for ages 3 to 7, and uses rabbits, kangaroos, and penguins to keep the child's attention while they learn their numbers. (My fiance played this one for an hour and a half!)

As I said earlier, I have yet to be disappointed with a Spinnaker-designed program. I had seen many of their programs in Commodore 64 versions before, and the T/S versions keep all of the great graphic and sound designs.

My hat goes off to the people at Spinnaker, for writing such great software, and to Marty DuBay, for bringing these great programs to the T/S users in the U.S. TSH

ASTRONOMY PROGRAMS (TS-2068): for astronomers, navigators, science classes, etc. Compute positions of Sun, Moon, & planets for any date; find dates & times of moon phases, solar & lunar eclipses; sunrise/sunset times; equinoxes/solstices (seasons); Julian Day & sidereal time, & 10000 year calendar. Complete set (tape & manual): \$14.95



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SPECTRUM

YS MEGABASIC
Spectrum Software Review
by Jack Keene

YS MegaBasic is the product of Your Spectrum Software and Mike Leaman. This program constitutes a most interesting approach to some of the limitations of Sinclair Basic and augments it with 35 new commands plus three type fonts and four print sizes (one of which is a 64 column mode). Add window capability (as many as 10), sprites, simple multitasking, enhanced sound, named procedure operation, a monitor for examination of the Z80 registers, trace function for debugging and a bit more.

To completely describe MegaBasic would require considerable type, as this is almost a new Basic in itself. Rather than that, let me describe some of the things that haven't been mentioned in the ad for it.

As received, MegaBasic 1.0 comes complete with a couple of major bugs. However, a listing of a bug fix is included which upgrades you to version 3.0. Version 1.0 is a rough diamond. Version 3.0 is a real gem. It is a bit disconcerting to have to patch new software when you receive it but this one is worth it. The patch is 350+ bytes of code and as far as I can tell everything works. Hopefully, version 3.0 is the published version at this date. MegaBasic leaves about 21K free for your programs.

This may seem a bit restrictive to some, but when you consider the facility of the extension you will find that less program is required to accomplish a lot of things.

Named procedures give MegaBasic a very un-Basic character. This feature will give you the chance to explore the possibility of a structured program approach. The procedure stack allows nesting of up to ten procedures. This is easy to use as well as useful.

One of the things that you will notice is that the familiar one key entry of keywords is gone. A bit of a shock, but I think that I'll live through it. There ARE abbreviations for most keywords. Also Sinclair Basic is a subset of MegaBasic so you aren't going completely from scratch.

Documentation is the in form of a small 32 page booklet which at first seems short but does cover it all. It could use a command index and a bit more of examples of how some of the commands work but all in all documentation is adequate. All in all, I'd score MegaBasic a 10 in the 3.0 version.

You can get it from: The English Micro Connection, 15 Kilburn Ct, Newport, Rhode Island, 02840. The cost is \$12.95 plus \$1 for P&H. Well worth the money. TSH

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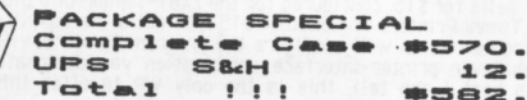
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TS1000/ZX81

REVIEWS FOR THE NON-PROGRAMMER
by A. Gindin
WORD* from SIRIUSWARE

This review is being written with the help of WORD*, a word processor written by David Wood of Siriusware, 6 Turning Mill Road, Lexington, MA 02173 (he likes puns). It sells for \$15. configured for the ZX81-Timex1000 plus a Timex Printer. For another \$15. you get a "Personality module" which will configure the program to work with whatever printer-interface combination you designate. As best I can tell, this is the only WP to offer this amount of customization.

WORD* offers essentially all the features of its namesake. While memory-intensive features such as a spelling checker or a mail-merge are obviously not here, one can format page size, page length, center headings, alter line spacing and use tabs and paragraph indents.

All the Sinclair punctuation is available in addition to underline and . Wood has also speeded up the keyboard to about twice the Sinclair speed, which easily keeps ahead of my 20 wpm on E-Z KEY keyboard.

SOFTWARE REVIEW: BRITISH TS1000/ZX81 SOFTWARE "FORTY NINER" SOFTWARE FARM by Bob Woish

Available from:
Curry Computer
5344 West Banff Lane
Glendale, AZ 85306
Price: \$10.95 ppd

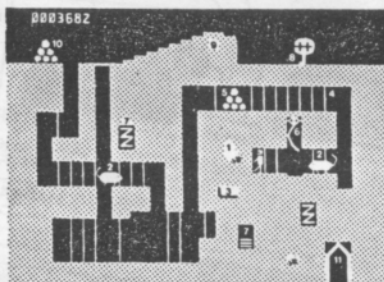
Guess what? The TS1000 DOES have high resolution capabilities built right in, if you know how to access them. Some ingenious soul, somewhere in England, found a way to do just that. A trio of programs thus comes across the Atlantic, which have resolution equal to that of the Spectrum. ROCKETMAN, FORTY NINER and ZTRICATOR are the three revolutionary games from the Software farm. No hardware modification is needed - the hi-res is entirely in the software. How? I'm not sure. Apparently the author has bypassed the Sinclair character set and addressed each pixel individually. To say the least, it is absolutely stunning to see this resolution on the TS1000.

FORTY NINER is the program I tried first. Besides the amazing graphics, the game is a winner in it's own right. Written entirely in machine code, it presents quite a busy arcade type screen and still maintains adequate speed.

The object of the game is to go down into a gold mine and collect all the nuggets on each screen. To do this you must burrow into the Earth and touch each nugget on the screen. This is not nearly as easy as it sounds. There are giant rats in the ground who chase you, and if caught, you lose a life. The rats move faster in the mines you dig as you go along, but if you can trick them into crawling over one of the snake pits, and succeed in releasing the snake it will destroy the rat, as it devours everything in it's path on it's way to the surface. This includes you, so watch out where you dig after a snake has been let loose. You also have to keep an eye on the gremlin at the top of the screen, who is eating away at a pile of waste earth in order to enter the mine. Once he gets in, you are dinner for sure according to the instructions. I have not

Are there any problems? The better the WP the more commands there are and the harder it is to learn. There are over 12 pages of documentation, some of which require careful reading and some testing. While Wood gives a few tables to summarize I found I needed to add to these to keep track of everything. Be sure to keep an eye on the status indicators at the bottom of the page. If you type in the wrong mode, you can lose an entire screen, or worse the program will lock up and you will lose it all. Always put a new page marker at the end of text. This makes the programs start each draft at the place indicated on the page.

In summary, the program offers everything I feel it should and is as easy as possible to use. But the thing this program offers that is not available elsewhere is Dave Wood. If you call, he answers. If you write, you get a card of a letter back, fast. If indicated, he will send a new tape - at one time I've had four copies of the program. Over the last year or so that I have corresponded with Dave, the program has been revised and I'm sure I'll receive the next revision when it is available. There may be a better WP out there, but I can't believe there is better support, anywhere. TSH



- | | | |
|------------------|---------------|-------------------|
| 1. Nuggets | 4. Support | 8. Gremlin |
| 2. Giant Rats | 5. Cave In | 9. Mound |
| 3. Burrowing Rat | 6. Snake | 10. Pile of Earth |
| | 7. Snake Nest | 11. Cave |

yet seen him get into the mine, despite my effort to let him get in just to see what would happen. The idea is to return occasionally to the mine's entrance to replenish the waste earth pile. I get the feeling I will be seeing more of Mr. Gremlin as I progress to more and more screens, as he will have had more time to eat through the pile. You progress to the next screen by walking through the door which appears after all nuggets have been gathered. In successive screens there are more rats to deal with and less snakes to kill them with. On screen, scoring is also in traditional computer digits rather than Sinclair characters.

I have one gripe: there is no printer support. It would have been nice to be able to copy at least the title screen to show off the graphics to those who scoff the "Limitations" of the ZX/TS.

If you buy one game this year, this is it. Until you see this for yourself, you'll never know how good the graphics of the amazing black midget can be.

Now for the bad news. According to Curry Computer the other two games from Software Farm have proven to have such bad loading problems that Curry has, at least for now, decided to offer only FORTY NINER from the series. Also, my copy of FORTY NINER is marked "Load FORTY NINER". It should say "Load FORTY NINER". I hope the manufacturer can resolve the loading problem. Such ingenious programming deserves better production. TSH

THE QL REPORT
FROM CURRY COMPUTER
5344 W. Banff
Glendale, AZ 85306

NOTE: This report is excerpted from Curry Computer's "QL Report" Nos. 6 & 7 with the kind permission of Rob Curry.

So it is August and within the last month the 68000 market has really heated up! Commodore unveiled the highly touted (and highly priced) Amiga on July 23rd in Lincoln Center, but probably will not begin shipping until September. Atari shipped a couple of thousand 520 ST's to distributors last week and promised to ship 30,000 by the end of August. American Express began shipping QL's July 23rd. So by the time you read this, the computers should be making their way to your houses and offices.

With so much action in the 68000 market, a lot of our customers are asking "Why doesn't Sinclair advertise more or get more articles in magazines?" The demand for the QL, according to informed sources, has been overwhelming. When quantities are sufficient to fill orders immediately, then you will see advertising. The best possible advertising for now is for you to tell 5 friends how great the QL is, not to hear from a computer salesman (present company excepted) that it is a "stupendous" machine.

When you get your QL, compare QUILL with the Word processor that comes with the ST or the Amiga, and the two drives and anything else you want to compare, and the QL is the clear cut winner. And then to add icing to the cake, show them the list of available programs for the QL and ask what they have that they can order NOW for their machines.

As we stated in earlier Reports, because the QL comes bundled with such four excellent programs as the Psion suite, we feel it is your best buy. You will not be able to do as much with an Atari or Amiga straight out of the box.

We of course would like to sell you the QL but remember that the Atari ST and Amiga have a higher price tag primarily due to all the middlemen that get a percentage—manufacturer's rep, distributor, dealer, advertising agency, etc. The price tag on the QL is for you, the customer. The Boston office of Sinclair is very concerned about pleasing you directly. How many other computer companies want to do this? Between Sinclair Research and third party companies such as ours who support the QL, you will get all the support you need. Remember you can call until Midnight E.D.T. Monday through Thursday to place an order or request information.

We will concentrate mainly on new products in this Report. We have received our first shipment of CST disk interfaces and have already sold half of the order. We have coming an Expansion Consul which will allow you to connect the disk interface and extra memory to your QL at the same time. We also have on order 256K RAM memory which can be upgraded to 512K.

We have in transit Metacomco's QL PASCAL a true Pascal compiler for the QL which produces native 68000 code. It conforms very closely to the international standard ISO-7185, making it ideal for commercial applications. Metacomco will also be releasing a QL version of Lattice C in September.

In the June issue of QL USER (in stock), there is an excellent article on a company that is producing quality software for the QL—Digital Precision. We mentioned their

Sprite Generator briefly last issue. They also have a QL version of Backgammon which is as good as QL Chess if you are a backgammon lover. The graphics are superb and you have a choice of playing against the computer or a human opponent. Digital Precision also have a Monitor program written in 100% machine code that is very fast. Order the current issue of QL USER to read more about this fine company. All of their software we have in stock.

Cartridge Doctor is a new release from Talent and this program should be included in your list of "must buy" programs for the QL. It helps you rescue data from corrupt or damaged cartridges. In most cases it will enable you to recover files from a bad medium, recover files which have been deleted, and recover files with lost or damaged blocks using the 'block patch' utility. Most of us have on one occasion or another deleted a file accidentally; usually a file that has crucial data on it. Now with this program you have a chance to recover that important data. Talent also produces GraphiQL and Zkul and West.

Next we have Agenda. This is a calendar based program to remind you of appointments, phone-messages, birthdays, holiday, bills, anniversaries, etc. This is the type of program you should boot up every morning just to see what is ahead for the day. It is a handy way to keep track of all sorts of information. You could, for example, in a medical office use it to see when there was free time available for patients, or in a garage to see when a customer could bring his car in for work. In stock and available now.

QDumps is a screen dump utility written in 100% machine code for Epson and Epson compatible printers. It adds the word "Dumps" to the list of SuperBasic keywords so you merely type that word and out goes a copy of the screen to your printer. We have used QDumps to print the demos in DP Sprite Generator so send a stamp if you would like to see it and we will mail you a xerox of it. In fact, if you would like more info on any program send us a stamp to help defray costs and we will get the information out immediately.

In the book department, we will have in stock shortly Adrian Dicken's excellent book, QL Advanced User Guide. This is probably the authoritative guide to the QL and provides complete instructions to QDOS. There is a complete 68008 reference section and covers everything from traps and utilities to jobs and multi-tasking.

For those of you who will be writing programs for the QL or those of you who will be storing a lot of data on microdrive cartridges, we have a Microdrive Labels Starter Pak. The pak includes 500 each of red, green, blue, and white microdrive labels on tractor feed sheets plus on microdrive cartridge a program to print out the labels on your printer.

WD Utilities for the QL now has over 400 references in QLRefs, an Archive database file. For those of you who need information on everything from disk drives to installing various printer drivers, this file will show where to get the information. Hopefully we will have most of the articles in stock and can supply you with the information you need. Just send a stamp.

We know most of you are buying a QL for business applications or for the languages available but there are also some excellent games out. Zkul and West we have mentioned before and are great textual adventure games.

Quest Automation, better known for their range of disk drives and RAM expansions, has new software titles out for the QL. The first is called Quest—The Adventure and is billed as a graphic adventure game set on the high seas where your mission is to explore islands in search of

treasure. Beware of other pirates, cannibals, sharks, etc. We have this on order but have not seen it and will review it in a future issue. Also available is Blackjack which we will review probably next month.

From the Rumour Mill and Information department we hear Sinclair is set to release a Jet Set Willy type arcade game for the QL called QL Cavern--sounds interesting...The QLUB will cost \$50.00 a year here in the States...Delays in American QL's may have been caused by cash-flow problems which now have been remedied by Maxwell...QL selling better in Europe than in U.K...Shortage of microdrive cartridges may last awhile...Latest issue of

QLUB magazine in U.K. has article on how to send and receive files between IBM and your QL...Foreign language versions of the QL are becoming available including Spanish, French, Italian, and Danish and later Turkish, Arabic, Swedish, and Greek...

We are beginning to compile lists of different types of monochrome and RGB monitors and printers that are compatible with the QL. Please write if you need to know whether a certain make will work or not. Or, if you find one yourself that works or partially works, etc. let us know so we can pass the information along to others. TSH

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